

**SOME PARTICULARS
OF THE PRESENT
STATE OF MOUNT
VESUVIUS; WITH THE
ACCOUNT OF A...**

William Hamilton



SOME PARTICULARS, &c.

A 2 B,

Paris, January 10, 1794.

THE capture of Mount Valerius, which began in the month of November 1793, nearly at the moment of my return from England to this Capital, and which continued in some degree till about the end of last month, has afforded much amusement to travellers unacquainted with the wonderful operations of nature, but no new circumstances that could justify my troubling you with a letter on the subject. The lava that overflowed the rim of the crater, or Elud from the all others as, sometimes, on that side which faces the mountain of Somma, and ran west or left at once, and at times in down or four channels, rapidly descended down the flanks of the central part of the volcano; sometimes descending and spreading itself in the valley between the two mountains; and once, when the eruption was in its greatest force, in the month of November last, the lava descended still lower, and did some damage to the vineyards, and cultivated parts at the foot of Valerius, towards the village of St. Giuliano; but generally

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the

the lava, not being checked, stopped and cooled before it was able to reach the valley. By the accumulation of these lava's on the Banks of Volturno, its level has been greatly altered, and by the frequent explosion of foam and ashes, a considerable mountain has been formed within the river, which now rising much above its own low level has thereby given that part of the country a new appearance. Just before I left Naples, in May 1783, I was at the top of Volturno. The river was certainly then more than 200 feet deep, and was impassable, on this being nearly perpendicular. The eruption, however, has been so immediate as would be defined by the inclination of this city, a perhaps quantity of lava having been disgorged; which mass, cooled within the bowels of the earth, would probably have sustained tremors, and even slight ones might prove fatal to Naples, which besides are, in general, very high, all built, and a great number in almost every street already supported by props, having either suffered by former earthquakes, or from the high volcanic life having been washed from under their foundations by the torrents of rain water from the high grounds which surround Naples, and on which a great part of the town itself is built.

From the time of the last considerable eruption of Mount Vesuvius, in August 1793 (described in one of my former communications to the Royal Society) to this day, I have, with the assistance of the Father Antonio Paggi*, kept an exact diary of the operations of Volturno, with drawings, showing, by the quantity of smoke, the degree of ferment-

* The Father Antonio Paggi is the person that was named the master of sailing and navigating the three ancient universities of Montecassino, and who writes regularly to Naples, to the King, and to all cities, of Mount Vesuvius.

time of the volcano, and the noise of the lava's during the last eruption, and the changes that have been made in the form of the mountain itself by the lava's and fires that have been spoken. The journal is containing very curious and interesting; it is especially so with respect to the pointing out a variety of singular effects that different currents of air have upon the smoke that rises from the crater of Volcanus, elevated (as you know, Sir) more than *giaco* feet above the level of the sea; but, except the smoke increasing considerably and suddenly when the lava is agitated, and the wind blows from that quarter, the operations of Volcanus appear to be very expeditious and systematic. One day there will be the appearance of a violent fermentation, and the next all is calmed again: but whenever the smoke has been attended with considerable quantities of stones and cinders, I have constantly observed, that the lava has then after made its appearance, either by boiling over the crater, or forcing its passage through crevices in the central part of the volcano. As long as I remain in this country, and have the necessary assistance of the above-mentioned ingenious Monk (who is as excellent a draughtsman as he is an accurate and diligent observer) the Volcanus story shall be continued; and I hope one day to have the honour of presenting this curious manuscript (which begins now to be voluminous) to the Royal Society, if it should think them worthy of a place in the Library of the Society.

Having never had an opportunity of examining the Islands of Fuata, Palmaria, Xucana, and other small islands, so called rocks, situated between the coast of Volcanus and Monte Canella, near Yucana, on the Continent; and thinking that by a tour of these islands I should be enabled to make my former observations more complete, and to communicate

to JAY, Sir, from some of the only valuable parts of this extraordinary library undisturbed, I determined to take advantage of the absence of their British Myriads (who were then making the tour of India) and visit these islands. The first I put this plan in execution, I made a long excursion to the province of Mysore, as far as the Lake of Channarayana, commonly called Padman, and where the famous library of the Emperor CHARVET (a most dependent work * for deriving that lake contains nearly entire, though filled up with mistakes and such in many parts, and of course which. The name of this lake, which is more than 30 miles in circumference, surrounds itself, and is surrounded by the rich and cultivated plains as its frontier. It is surrounded by very high mountains, many of them covered with them, and in the foot of them are many villages, and rich and well cultivated farms. Upon the whole it is the most beautiful lake I ever saw, and would be complete, if the neighbouring mountains were better wooded. This lake resembles abundance of Sir, but not of the full quality: a few large trees, but mostly small, bushy, and dense. In the shallow water on the borders of the lake, I saw thousands of water snakes, crawling and jumping upon a little like the one themselves, but much more small, though their defensive weapons formed to suit them but little against such circumstances.

I went with twelve into the valley of Charvet, as far as I could. It is a narrow underground-valley, three miles long, and great part of it cut through a hard rock; the other parts supported by masonry, with walls thick as grove and high.

* A description of the library of Charvet, with plans (plans) are very much too long published by CHARVET, in the first book in which he has given an account of his journey.

According

According to Serapentes, Chaghatay employed thirty thousand men eleven years on this great work, intended to convey the superfluous water of the lake into the bed of the river Lura, now called Ganghiano; and I make no doubt, but that if it was cleared and repaired, it would again restore that people.

It is no wonder that it is a most magnificent monument of industry.

The whole country from Aquila, the native place of Alexander², by Sida, Sora, Cornelia, and Capistia, to the lake of Celina, is, in my opinion, infinitely more beautiful and picturesque than any spot I have yet seen on the Alps, or Saava, Rhenus, or the Tyrol. The road is not unlike the mountains, and indeed is scarcely less rugged; however, the beds of rocks, and a river infested with banditti; a party of which, consisting of twenty-two, had quartered themselves in a village which I passed through, and left it but a week before my arrival. There are many pools and fountains in the adjacent mountains, which still maintain their copiousness in the winter. The upper-est, great forest, or *lyra*, is sometimes found in the woods of this part of Armenia.

The road follows the windings of the Ganghiano, which is here a beautiful clear sweet stream, with a great variety of cascades and water-falls, particularly a double one at Sida, over which place Caxar has a villa, and there are still three remains of it, though converted to a chapel. The valley is extensive, and abounds with fruit trees, vines, figs, and olives. Large tracts of land are here and there covered with woods of

² Herodotus had a large villa, about twelve miles distant from Aquila. It was in this the spot, on which now stands the only remnant of the ancient cities of the Hellenes in Italy. It is in the Turkish town, and are here existing both of the ruins of Alexander's house, and in perfect ruins a high altar.

not and shallow, all darker ones of the largest size. The mountains around the valley rise gently, and are strewed with other modern ridges, towns, and villages, at the sides of which rest. The west slope of mountains, rising behind these, are covered with pine, larch, and such trees and shrubs as usually abound in a lake district; and above these a third range of mountains and rocks, being the most elevated part of the Apennines, rise much higher, and, being covered with eternal snow, make a beautiful contrast with the rich valley above-mentioned; and the view is at the same distance, as not to give that uncomfortable chill to the air, which I have always found in the narrow valleys of the Alps and the Tyrol. Excuse me, Sir, if from the impression which this commanding and fertile frequented country has left on my mind, I have been led to depart from the subject of this letter, to which I will return directly.

On the 17th of August last I went in a boat to the island of Ichia. I have nothing to add to my former observations on this island, already communicated to the Royal Society; except that about half past four o'clock, at a place called *San Angelo*, situated between the towns of Ithra and Ferra, a column of boiling water bubbles upon the surface of the sea with great force, and communicates its heat to the water of the sea near it; but as the wind was very high, and the surf considerable, I was not able then to examine this curious spot as I could have wished, but will return there on purpose some other time. The inhabitants of the neighbourhood told me, that it always boiled up in the same manner, winter and summer; and that it was of great value to them in treating their planks for ship-building, and that the fishermen who frequently catch fish of this natural column as hot their fish. Though I

have

I have pulled it before three many weeks in the Island of Elba, I never before heard of this phenomenon: but in my description of this Island mention is made of several spots where, near the shore, I had found, when walking on the sea, the sand under my feet to be as to oblige some water bubble. This boiling spring reminds me of one near Vienna in the Roman Camp, which I have seen, and is called the *Salicetum*. It is a circular pool of about four feet in diameter, and astonishingly deep, the water of which is continually boiling. It is situated in a place surrounded by volcanic mountains. A long mountain flows on the surface of the pool, which being carried off by the superfluous water is deposited, and is constantly forming a lake or reef, of which all the fill around the pool is composed. You have seen, Sir, the *Misopetion* in greater perfection is found, at the famous boiling spring of Caprin. I am convinced, that many of the fiercest and most tempestuous winds we meet with, in winter, formed by volcanoes, have been produced in the same manner.

The ridge of *Angeli* I viewed at the Island of Ventotene, about twenty-five miles from Elba. It is greatly improved since my former visit, seven or eight years ago, when his Britannic Majesty had planted a little colony there. It then produced neither corn nor wine; now it furnishes annually at least twenty boats of wine and two thousand bushels of corn. The soil is remarkably fertile, from whence it probably took its ancient Greek name of *Procharis*. This Island contains at present more than three hundred inhabitants. The Island of Ventotene, and the *Giardin* are called *St. Stefano*, within a mile of it, having been dedicated in my Camp Phlegrean, as being both entirely composed of volcanic matter, I need not trouble you further on their topography; I will only mention a

various circumstances in the natural history of birds, of which I was informed by an officer of the garrison of Vancouver, who is a great sportsman, and dwelt often in the island of St. Sebas, surrounded only by bushes, and a large herd of deer-gulls; but is occasionally visited, as a refuge place, by flocks of birds of passage. In the month of May great flocks of quails arrive there from Africa, upon which fowls, and many of them kill as only prey for the hawks and the gulls; but, as their arrival depends upon one prevailing wind, there is often an interval of many days between one flight and another, by which I was informed, that the hawks constantly, during the flights, make a provision of such day's prey, laying them up in separate heaps of five or seven near their houses, always looking first upon those of the oldest date. The deer-gulls have not the same privilege, but greedily fall upon these unhappy victims as their hunger then before they reach the shore; and, having lost them throughout the sea, swallow numbers of them whole. Extraordinary as this may appear, yet is fully related by persons of credibility on my branch of natural history are always ready. I thought you would excuse this digression. Give me leave likewise to add, for the information of the curious in antiquities, that, during my stay in the island of Vancouver, I got out of the ruins of an elegant ancient house (destroyed when here built for the eldest Prince, daughter of Anacortes, which she was to make him) a fragment of a tile, on which are stamped the following characters in bold letters,

EXCELS
 TRUIT
 ANNO 17

which, according to the interpretation of a celebrated antiquary in Naples, was *Opto Maximo et immensio Elio Prince Anacortes solutus*. I was informed, that several more

tiles,

tion, with a late inscription, had been dug up on the same spot, and had been made use of in building the church and barracks newly erected in this island. Another fragment of a tablet was likewise found here, and given to me, with the following inscription :

ANNO 4. 16.

which the first category explains, *ANNO 4. 16. PONZ.* For *Imperatoris Augusti Augustus*, but, I believe, there is no inscription in ancient authors of Augustus having begun at Ponziensis, or *Ponza's* birthplace; so that it can be no doubt.

Between Ventotene and the Island of Ponza, and from the latter at the distance of about twelve miles, a group of rocks rise from the shore the surface of the sea. They are called the *Isola*, and are composed of a compact lava; probably they are the small remains of another volcanic island, the higher parts of which may have been washed off and levelled by the action of the sea, which is open and violent here.

The 20th of August I sailed for the Island of Ponza, about thirty miles from Ventotene, and the next day I went on board at my tent. It is now five miles long; its greatest breadth was more than half a mile, and in those parts not more than the breadth last. It is surrounded by innumerable detached rocks, some of them very high, and most of which are of lava; in many are regularly formed balises, but none is large volcanic. In some parts the balises have a smooth rim of lava which are very small, and in spots (y) had one over another. Some rocks of these are in a perpendicular, others in an half-inclined, and others again in an inclined position; and the entire distribution, in which these rocks are found, are lost of the same nature as the balises. At that light these rocks have very much the appearance of the ruins of ancient Roman

break or rather the bedding, as may be seen in the drawing (See Tab. XI fig. 1.) rises on the *Sp.*. One rock, as appears in the drawing (See Tab. XII fig. 2.) is composed of large spherical boulders, and in many parts of the island I found the lava had indeed to enter the blue spherical form, though on a much smaller scale, some of the boulders round boulders being just two feet in diameter. All these rocks have certainly been detached by the action of the sea from the island, which is entirely composed of volcanic matter, lava's, and tuff's, of various qualities and tints, green, yellow, black, and white. Some of the tuff's, as well as the lava's, are of a texture more compact than others, and in these parts of the island great tracks seem to have undergone the same operation as is mentioned in one of my former observations to be in fact done in a spot called the *Palmwell*, on the north of the *Bel-Island*, near *Parade*, and where a hot sulphureous fœtulis will vapor convert all which it penetrates, whether lava's, tuff's, volcanic ashes, or porous stones, into a pure clay, mostly white, or with a tinge that of red, blue, green, or yellow. The appearance of a soil of volcanic matter, which has undergone this operation, is well expressed in the view of the inside of the bastion of *Point* (Tab. XI, fig. 1.) But I was so struck with the beautiful and numerous appearance of one of dark light volcanic grounds converted to a pure light-colored clay (Tab. XII, fig. 1.) in contrast with a neighbouring dark basine rock, that I could do the drawing, which accompanies this paper (See Tab. XII.) to be made on the spot. You, Sir, who have seen such a variety of countries, will still think this view singular and beautiful. I can assure you, it is very much, except the rock of round basine (fig. 2.) which, as nature, is at a distance from this spot, and only placed here

to,

recollecting what I have written on my subjects. In one part of the island there is a lot of tuffa, remarkably good for the purpose of building. It is as hard as our best stone, and nearly of the same colour, without any mixture of fragments of lava or pumice stones, which usually strewed in the tuffa's in the neighbourhood of Naples, Isola, and Ponza.

The drawing (see Tab. XI), which is a view of the harbour of Ponza, will give you a very good idea of the appearance of the different sorts of lava and basalt which have been represented, by the form of the line, from the lower parts of the Mount, and of which there are no certain number, as you will see in the next geometrical plan of the island of Ponza (Tab. X), which likewise accompanies this letter.

When I was lately in England, I happened at many of the manufacturers of glass, whether it had ever happened, that the glass-making in their furnaces had taken any distinct forms like prism or crystallization; but I got no satisfactory answer until I applied to the ingenious Mr. FARRER, of Flint-street, who not only informed me, that, some years ago, a quantity of broken glass had been accidently discovered by taking fish a shore in Scotland; but also gave me several curious specimens of the glass which some of them are in basins, which may be easily separated; and others resemble basins when new in substance, having regular form. I was much pleased with this discovery, proving to me, beyond a doubt, the volcanic origin of much basalt. Many of the rocks of lava, of the island of Ponza are, with respect to their configuration, strikingly like the specimens of Mr. FARRER's short conical glass, some being very regularly formed basins, but all having a tendency towards it. Mr. FARRER would not consent for the reason that occasioned his glass to take the ball his

Form.

domes; but I have remarked, both in Selly and in Noyón, that such levels as have been seen the first, are either horizontal or regular inclines, or have a great tendency towards such a form. The base of Mount Erazo, which we take the for our level, as appears in my account of them in the *Campo Pilagani*, are perfect inclines, and a level that we take the for from Mount Yelovino, near Torre del Guano, is also, but an without tendency to the incline domes. On Mount Yelovino I never found any thing like columns of incline, except the characteristic at Torre del Guano, and some fragments of very complete ones, which I picked up near the crater, after the eruption of 1799, and which had been thrown out of the mouth of the volcano.

The island of Palmarito, which is about four miles from Potosí, is not much more than a mile in circumference, is composed of the same volcanic matter, and probably was once a part of Potosí; and indeed it appears as if the island of Zarcos, which lies at about the same distance from the island of Potosí, was once likewise a part of the great island of Potosí; for many rocks of lava rise above water in a line between the two last mentioned islands, and the water is much shallower there than in the other parts of the gulph of Tiorongo.

The island of Zarcos is larger and much higher than Palmarito, and the half of the island north the Condamar is composed of a limestone, exactly similar to that of the Apurimac, as the Condamar was by; the other half is composed of lava's and tuff's, resembling in every respect the hill of the other islands just described. Neither Palmarito nor Zarcos are inhabited; but the latter formerly contained a distribution for the use of the inhabitants of Potosí, which contains, including the garden, upwards to nine hundred hundred.

The

The sublimated cloud of St. Barbara themselves find in the lake among the the sublimations of Ventilation.

It is probable, that all kinds of clouds and water may in time be loaded by the action of the sea. Ponce, in its position here, is the most fertile of a volcanic island, as little more than its harbor, which is not so much, and they seem to be slowly and gradually modifying every. Other new volcanic clouds may likewise be produced in such parts.

The gulches of Guay and Troncones, in the south of Guay, because another Campo Ponce*, the, as has been mentioned in one of my former communications on this subject, the salt and brine plain is called, which extends from the bay of Naples to the Apennines, behind Coler's and Capes, has evidently been recently formed by a foundation of such volcanic eruptions. Volcanic, the Salinaria, and the high volcanic ground, on which great part of this city is built, were once probably clouds, and we may consider, the Heads of Ponce, Salin, Venturina, Polanco, Ponce, and Troncones, as the outlines of a new portion of land, situated by nature to be added to the neighbouring Continents; and the Lagoon Islands (all of which are volcanic) may be looked upon in the same light with respect to a future intended addition of territory to the island of Sicily. If you cast your eye, Sir, on the map at the head of my description of the Campo Ponce, you will better understand my meaning.

* The present of the salt of Ponce, who has added to a city above, and the, the clouds are all large in comparison; and there had been one volcanic cloud there about the year 1790; but the sea had been to one side, there was no way of the city and the of the great volcanic which delayed (being) that the clouds are of them, which were the clouds of the clouds, and the clouds there. This time is gone, and the volcanic water, which goes shall be the clouds, a new volcano.

Tha.

The more opportunities I have of examining this volcanic country, the more I am convinced of the truth of what I have already remarked to you, which is, that volcanoes should be considered as a creative rather than a destructive agency. Many new elevations have been made of late years, particularly, as you well know, Sir, in the South-Sea, of islands which were their birth to volcanoes, eruptions, and lava, indeed, where the volcano lies still quiescent. I am led to believe, that upon further examination, most of the elevated islands at a considerable distance from Otaheite would be found to have a volcanic origin: so the low and flat islands appear in general to have been formed at the foot of the protuberance, both in earth, mountains, &c. So I will stop here, and not detain from the place which I have hitherto chiefly attended, of reporting faithfully to my learned Secretary of the Royal Society such facts only as come immediately under my own observation, and as I think may be worthy of their notice, and leave them at full liberty to make upon them.

We may later perhaps, as a very great progress has been made of late years in the knowledge of volcanoes, that by combining both observations as we are thereby in possession of, with those which may be made hereafter, in the four quarters of the world (so all of which nature seems to have opened in a late manner), a much better theory of the earth may be established than the miserable one that has hitherto appeared.

Those who have not had an opportunity of examining a volcanic country, as I have for more than twenty years, would little suspect, that many curious productions and modifications of heat and cold's were of a volcanic origin: especially when they have unknown causes claimed operations of nature, some of which, as I have mentioned in a former

DISCOURSE.

remembrance, as well as in this, have been capable of answering calls, needs, and justice there, one the parallel day.

I have remarked, that young children in this branch of natural history are not too apt to fall into the dangerous error of leaving the rules of nature to their unaided observation; should they suspect a moment to have been a volcano, they immediately dash to its summit to look for the crater, and if they neither find one, or any signs of fire or gaseousness, directly conclude such a mountain not to be volcanic; whereas, only suppose Mount Etna to have ceased erupting for many ages, and that half of its central part should have crumbled away by time (which would naturally be the softest part) and the harder parts remain in place, forming an immense skirt of mountains (thus extending to its base more than one hundred and fifty miles), such an observer as I have just mentioned would certainly not find a crater on the top of any of these mountains, and yet there would be too limited in number, that the whole range of mountains were only part of what once constituted a complete cone and crest of a volcano. It seems to me strongly recommended to children in this, as well as in every other branch of natural history, not to be overbold in their decisions, not to attribute every probability they meet with to a single question of nature, when perhaps a few unknown causes, of which I have given examples in the field which has been the principal subject of this letter. That which was one day in a volcano then, and formed by an inlet in the sea, becomes changed in position, by the action of the volcanic fire, and the addition of some second ingredients, such as its lake and weeds, and is upon transformed to a pure clay by another volcanic period.

of the *WALLACE HAMILTON'S* *Diagnosis*

of cotton. The new silk may indeed decide as to the present quality of my natural production; but it would be possessing too to hope to decide as to its future state. As to me I am judge of a silk cotton country, after which time to be constantly employed in comparing, describing, and rearing; but finally the ultimate and inevitable purpose, though as a rule perhaps needs too great and extensive for our weak and limited comprehension.

I have the pleasure to be, with great respectful attention, Sir,

W. HAMILTON.

P O S T S C R I P T.

THE work is not yet so perfectly quiet in Calicut and at Melina, as to encourage the colonists to begin to rebuild their houses, and they continue to live in wooden huts. There has, however, been an earthquake of consequence during their last three months. My conjecture, that the volcano matter (which was supposed to have descended the late earthquake) had rested still at the bottom of the sea between Calicut and Melina, seems to have been verified. In the plot of one of the Italian Nipolly's *Geographical*, having some time since the earthquake and under all the part of Calicut, where he had often anchored in company with Italian vessels, found no bottom till he came to day-day fishing, and having founded in one order out at his towards the point of Spawwater in Calicut, he still found the same considerable alteration in the depth of the sea. The colonists of Melina himself declare, that during the great earthquake of the year of February, 1783, the sea had boiled and boiled up tremendously all their point.

W. HAMILTON.

EXPLANATION OF THE PLATES.

Tab. X. Plan of the Head of Penna.

Tab. XI. View of part of the inside of the harbour of the Head of Penna.

Fig. 1. Rock of lava, which in many parts is fissured into regular small columns of a reddish ash, having probably been shaped with lava when. Most of the detached rocks of the island consist of this.

Fig. 2. See p. 174.

Tab. XII. View taken from the outside of the harbour of the Head of Penna, near the Light-house.

Fig. 3. Bank of volcanic matter converted to pure clay.

— 1. Dunes, with frons of grasses &c.

— 2. Banks of lava rising up into boldness & crags.

— 3. Rock composed of sparsely bedded.







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